CLAIMS

1. Method for the diafiltration of a product, which comprises the following steps:

(a) providing a product stream that consists of the product;

(b) providing a first fluid stream that consists of a wash fluid that is external to the product;

(c) providing a second fluid stream that consists of a permeate derived from the product itself;

(d) supplying the first and second fluid streams to the product stream in such a way that the product stream is diluted by the two fluid streams;

(e) feeding the product stream diluted with the first and second fluid streams to membrane filtration means (1); and

(f) adjusting the ratio of the two fluid streams to each other;

wherein permeate from the membrane filtration means (1) is supplied as the second fluid stream.

2. Method in accordance with Claim 1, wherein the total amount of fluid supplied by the first and second fluid streams is adjusted.

3. Method in accordance with either of the preceding claims, wherein the total amount of fluid supplied and/or the ratio of the two fluid streams to each other is automatically adjusted in a closed-loop control system (16, 17, 18, 19), especially as a function of process

parameters measured continuously or at intervals.

4. Method in accordance with Claim 2 or Claim 3, wherein the permeate flow of the membrane filtration means (1) is measured, and the total amount of fluid supplied by the first and second fluid streams is adjusted as a function of the measured permeate flow, especially to a value that is equal to the measured permeate flow.

5. Method in accordance with any of the preceding claims, wherein first and second fluid streams are provided which can be adjusted independently of each other.

6. Method in accordance with any of the preceding claims, wherein the circulated product stream is circulated through the membrane filtration means (1).

7. Method in accordance with any of the preceding claims, wherein the pressure on the permeate side of the membrane filtration means (1) is maintained at an essentially constant level, especially at essentially atmospheric pressure, independently of the total amount of fluid and/or independently of the ratio of the two fluid streams to each other.

8. Method in accordance with any of the preceding claims, wherein the product that is being supplied as the product stream has been previously washed in upstream diafiltration processes.

9. Method in accordance with Claim 8, wherein exclusively permeate is used as the wash fluid in the upstream diafiltration processes, and especially wherein permeate produced in the given diafiltration process and/or in the immediately downstream diafiltration process is used in the upstream diafiltration processes.

10. Method in accordance with Claim 8 or Claim 9, wherein, in the upstream diafiltration processes, the amounts of permeate produced by the filtration means (1) and the amounts of permeate supplied as wash fluid are adjusted, especially by automatic control, as a

function of the amounts of permeate produced, preferably to a value of 10% to 100% of the amounts of permeate produced, and especially to a value of 80% to 100% of the amounts of permeate produced.

11. Method in accordance with any of Claims 8 to 10, wherein the permeate sides of the membrane filtration means (1) used in the upstream diafiltration processes or in all of the diafiltration processes are maintained at a uniform, essentially constant pressure, especially at essentially atmospheric pressure.

12. Method in accordance with Claim 11, wherein the permeate sides of the membrane filtration means (1) used in the upstream diafiltration processes or in all of the diafiltration processes are connected with one another by connecting lines.

13. Method in accordance with any of the preceding claims, wherein additional membrane filtration processes, especially nanofiltration, ultrafiltration, and/or microfiltration processes, are carried out upstream of the diafiltration process and possibly of additional diafiltration processes upstream of the first diafiltration process.

14. Method in accordance with any of the preceding claims, wherein a fruit juice, especially a drupe juice, berry juice, citrus juice, pineapple juice, grape juice, apple juice, or pear juice, is used as the product.

15. Device for carrying out the method in accordance with any of the preceding claims, which comprises:

(a) membrane filtration means (1) with a product inlet (2), a product outlet (3), and a permeate outlet (4);

(b) a product supply line (9) for feeding a product stream to the product inlet (2) of the membrane filtration means (1);

(c) a wash fluid supply line (10) for feeding a wash fluid stream to the product stream;

(d) a permeate supply line (11) for feeding a permeate stream derived from the product itself to the product stream; and

(e) adjusting means (12, 13, 16, 17, 18, 19) for adjusting the ratio of the wash fluid stream and the permeate stream that are fed to the product stream;

wherein the permeate supply line (11) is designed as a permeate return line for returning permeate from the permeate outlet (4) of the membrane filtration means (1) to the product stream.

16. Device in accordance with Claim 15, wherein the adjusting means (12, 13, 16, 17, 18, 19) are designed in such a way that the wash fluid and permeate streams that are supplied can be adjusted independently of each other, especially in such a way that it is possible to adjust both the total amount of fluid, comprising the amount of wash fluid supplied and the amount of permeate supplied, and the ratio of the amount of wash fluid supplied to the amount of permeate supplied.

17. Device in accordance with Claim 16, wherein the adjusting means (12, 13, 16, 17, 18, 19) comprise an automatic control system, with which the total amount of fluid, comprising the amount of wash fluid supplied and the amount of permeate supplied, and/or the ratio of the amount of wash fluid supplied to the amount of permeate supplied can be automatically adjusted or controlled in a closed-loop control system (16, 17, 18 or 12, 13, 16, 17, 19), especially as a function of process parameters measured continuously or at intervals.

18. Device in accordance with any of Claims 15 to 18, wherein the product inlet (2) and product outlet (3) of the membrane filtration means (1) are connected by a circulation pump (5) to form a product circulation.

19. Device in accordance with Claim 18, which additionally comprises a product feed line (6) for feeding a product stream to the product circulation and a product discharge line (8) for discharging a product stream from the product circulation.

20. Device in accordance with Claim 19, wherein the product feed line (6) opens into the product circulation upstream of the product discharge line (8).

21. Device in accordance with Claim 19 or Claim 20, wherein the product feed line (6) and the product discharge line (8) are arranged in the product circulation in the region between the product outlet (3) of the membrane filtration means (1) and the circulation pump (5).

22. Device in accordance with any of Claims 19 to 21, wherein the wash fluid feed line (10) opens into the product circulation in the region between the product outlet (3) of the membrane filtration means (1) and the circulation pump (5), especially in the region between the product discharge line (8) and the circulation pump (5).

23. Device in accordance with any of Claims 19 to 22, wherein the permeate feed line (11) opens into the product circulation in the region between the product outlet (3) of the filtration means (1) and the circulation pump (5), especially in the region between the product discharge line (8) and the circulation pump (5).

24. Device in accordance with any of Claims 15 to 23, wherein the wash fluid supply line (10) and the permeate supply line (11) open into the product stream by two separate openings or by a common opening.

25. Device in accordance with any of Claims 15 to 24, wherein the device is designed in such a way that the pressure at the permeate outlet (4) of the filtration means (1) is independent of the amounts of wash fluid and permeate that are supplied, so that a change in these amounts does not cause a change in the pressure at the permeate outlet (4), and especially

wherein the device is designed in such a way that the pressure at the permeate outlet (4) is essentially constant at atmospheric pressure.

26. Device in accordance with any of Claims 15 to 25, wherein a permeate pump (13), especially one which can be automatically controlled, is installed in the permeate supply line (11).

27. Device in accordance with any of Claims 15 to 26, wherein a wash fluid pump (12), especially one which can be automatically controlled, is installed in the wash fluid supply line (10).

28. Filtration plant, especially a continuously operating membrane filtration plant, with a device in accordance with any of Claims 15 to 27.

29. Filtration plant in accordance with Claim 28, wherein one or more additional diafiltration stages (D2, D3) are installed upstream of the device (D1) in accordance with any of Claims 15 to 27, and wherein the filtration plant is designed in such a way that the additional diafiltration stages (D2, D3) can be supplied exclusively with their own permeate and/or permeate of the next downstream diafiltration stage (D2, D1).

30. Filtration plant in accordance with Claim 29, wherein the additional diafiltration stages (D2, D3) have adjusting means (13a, 13b), by which the amounts of permeate fed to the individual stages can be adjusted, especially independently of one another, and especially by which the amounts of permeate that are supplied can be adjusted to the permeate flow of the given diafiltration stage (D2, D3).

31. Filtration plant in accordance with Claim 30, wherein the adjusting means (13a, 13b) include an automatic control system (17), with which the given amount of permeate that is supplied can be automatically adjusted, especially to the amount of permeate of the given

diafiltration stage (D2, D3).

32. Filtration plant in accordance with any of Claims 28 to 31, wherein the filtration plant is designed in such a way that the pressures on the permeate sides of the filtration means (1a, 1b) of the additional diafiltration stages (D2, D3) are independent of the given amounts of permeate that are supplied, so that a change in these amounts does not result in any significant change in the pressures on the permeate sides of the filtration means (1a, 1b).

33. Filtration plant in accordance with any of Claims 28 to 32, wherein the permeate sides of the filtration means (1a, 1b) of the additional diafiltration stages (D2, D3) or of all of the diafiltration stages (D1, D2, D3) of the filtration plant are connected with one another in such a way that essentially the same pressure exists on the permeate sides of the filtration means (1a, 1b or 1, 1a, 1b) during the operation, and especially in such a way that the permeate sides can communicate with the environment, so that the pressure on the permeate sides corresponds essentially to atmospheric pressure.

34. Filtration plant in accordance with Claim 33, wherein the permeate sides of the filtration means (1a, 1b) of the additional diafiltration stages (D2, D3) are each connected with the permeate outlets of the filtration means (1, 1a) of the upstream diafiltration stage by permeate pumps (13a, 13b), especially permeate pumps that can be automatically controlled.

35. Filtration plant in accordance with any of Claims 28 to 34, wherein the plant has nanofiltration, ultrafiltration, and/or microfiltration stages (U1, U2, U3) upstream of the diafiltration stages (D1, D2, D3).

36. Use of the device in accordance with any of Claims 15 to 27 or the filtration plant in accordance with any of Claims 28 to 35 for the filtration of fruit juice, especially a drupe juice, berry juice, citrus juice, pineapple juice, grape juice, apple juice, or pear juice.